Colliding galaxies

To discuss ...

- What's a galaxy..?

  -- An ocean of stars. Our own Sun is a star in a galaxy named the Milky Way.
  (Many galaxies, including ours, also contain huge clouds of dust and gas.)

- Do galaxies stay away from each other..?

  -- No. Scientists have discovered that galaxies collide.

- Are we in any danger from another galaxy colliding with our own galaxy..?

  -- Yes, but it's not supposed to happen for another <u>five billion years</u>..!

- What happens when galaxies collide with each other..?

  -- Stars go flying as if they were poured into a mixing bowl and stirred by the gravity of other stars.
  -- New stars are formed, and some explode.
  -- Eventually, the galaxies may combine to form one big galaxy.

- *(Optional for older age groups)* When galaxies collide, do you think stars explode because they crash into each other?

  -- It seems incredible, but stars in colliding galaxies hardly ever crash into each other, because the stars are so far apart they usually all miss each other. The exploding stars are actually new stars that form when enormous clouds of dust and gas from the two galaxies are mixed together. These new stars are big and hot, and they "burn out" fast. They blow up all by themselves, in a huge explosion called a "supernova."

To do ... *(This follows the optional question above.)*

- Show why stars in colliding galaxies hardly ever crash into each other. Explain that, while pictures of galaxies look like thick clouds of stars from far away, when you get close to them, you find galaxies are mostly empty space. How empty..?

  Draw a chalk dot on the blackboard to represent our own Sun, reduced in scale to the size of a grain of sand (1 mm). On that scale, how close do you think the next closest star to the Sun would be in our own galaxy (the next "grain of sand")...?

  

  <u>The answer: 18 miles away..!</u> What's 18 miles away in your neighborhood..?
  Can you imagine putting another grain of sand there, with nothing in between..? No wonder the stars in galaxies usually all "miss" each other when galaxies collide..!

  (If you draw the scale of the Sun to about 6 inches in diameter, the closest star would be about 3,000 miles away – the distance from New York to Los Angeles.)